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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/806,557	10/17/2001	Neville Clarke	43153-9060	1489
23409	7590	08/09/2004	EXAMINER	
MICHAEL BEST & FRIEDRICH, LLP 100 E WISCONSIN AVENUE MILWAUKEE, WI 53202			BHAT, NINA NMN	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 08/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/806,557

Applicant(s)

CLARKE ET AL.

Examiner

N. Bhat

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11-29-01
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Applicant's preliminary amendment filed March 2001 is acknowledged wherein claims 3-26 have been substituted/amended and claims 27-28 have been cancelled.
2. The disclosure is objected to because of the following informalities: Applicant is required to include the heading "Brief Description of the Figures", on Page 6, line 18. Appropriate correction is required.
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
  1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/17804 in combination with Clarke USP 5,819,955.

WO 91/1780 teaches a cyclonic vacuum evaporate comprising a chamber having at least one entry port and a plurality of conical elements; wherein a liquid mixture is introduced into the chamber wherein the liquid circulates spirally towards the center of the chamber contacting the walls of the chamber as a thin film which causes the liquid

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to vaporize while liquid distilled collects in the lower part of the chamber. Figure 3, shows the process of how a liquid mineral oil is fractionated by means of the cyclonic evaporator. WO 91/1780 teaches the cyclonic evaporator apparatus as well as a process for fractional distillation of a liquid wherein a liquid mixture is tangentially introduced into a lower portion of a chamber of an evaporator to cause a portion of the mixture to evaporate producing vapors which are drawn upwardly into contact with the conical elements and collecting the condensed liquid in a lower portion of the chamber.

[Note the claims and particularly Pages 6, second paragraph and Pages 8-9]

However, WO 91/1780 does not specifically teach the specific construction and arrangement of the hydrocyclone separator and in-swirl generator as claimed.

Clarke'955 teaches a hydrocyclone separator and components for its use in separating grease from water in sewage; the feed stream, which includes grease, water and sewage, exits the inner helical duct and enters the separating chamber (10) [Figure 2] through the crescent shaped swirl exit. From Figure 4, the crescent shaped exit path (9), which is tapered at each end, is shown. The feed from the crescent shaped exit path is fed into the top portion of the separating chamber where each duct terminates. The inner helical duct converts the axial motion of the feed into a tangential motion causing swirling. The heavier material descends the separating chamber by means of the vortex and exits the chamber. The lighter material ascends the separating chamber within the central core of the vortex. It then continues out of the hydrocyclone through conduits 6 and exit tube 6a. [Note Column 4, lines 25-56] The structure of the hydrocyclone of Clarke'955 which is not connected to a heat exchanger is the same

structure of the instant invention but is configured as an evaporator which is relationship with a heat exchange medium so that while the fluid enters the hydrocyclone separation, takes place not only by density or specific gravity but also by evaporation of the lighter fraction from the heavier fraction.

It would have been obvious to one having ordinary skill in the art to separate liquids using a vacuum cyclonic evaporator to separate or fractionate liquids into heavier and light fractions to effect separation from reading WO 91/1780. WO 91/1780 teaches using a cyclonic evaporator, which further includes vacuum or pressure for effecting separation of the liquids. WO 91/1780 does not provide the in-swirl motion or generator as claimed nor is the specific arrangement for creating the vortex or spiral flow through the evaporator as claimed. WO 91/1780 does teach that the art recognizes separation of liquids using a cyclonic evaporator, the fluid through the evaporator is tangentially directed and a spiral type of motion is created with the baffles, which have been positioned in the evaporator. The specific arrangement to create of the hydrocyclone is not the same as has been claimed in the instant invention. This deficiency in the hydrocyclone arrangement is fully taught by Clarke'955 who teaches the hydrocyclone but not in combination with a heat exchanger or heating medium so that the hydrocyclone would operate as an evaporator. It would have been obvious to modify the cyclonic evaporator of WO 91/1780 to include the hydrocyclone of Clarke'955 in order to perfect separation by density or specific gravity which is taught in Clarke'995 to separate fluids such as grease from waste stream which to be used in a cyclonic evaporator of WO 91/1780 so to provide a cyclonic evaporator with improved

separation and fractional distillation the modification of the cyclone to effect improved separation and fractionation of a liquid stream would have been obvious to one having skill in the art at the time the invention was made.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kenton'207 teaches using a cyclonic vacuum evaporator for refining oil. Benzing et al. teach a process of evaporating a liquid gas mixture. Clarke'198 teaches a separation apparatus and method for separating two fluids having different densities of specific gravities. Clarke et al.'784 teach a cyclone separator for separating components of a liquid mixture include oil and water phases. Atkins et al. teach a distillation apparatus for recovering citrus essence. GB 268418 teaches separation of components of mixtures. EP 0 873 773 teach a vertical evaporator. EP 0747102 teaches a method and apparatus for refining used oil using a cyclonic vacuum evaporator. Kenton RE38,366 teaches an oil re-refining apparatus.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



N. Bhat  
Primary Examiner  
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